SEQUENCE LISTING

<110> Frank, Markus

Sayegh, Mohamed

<120> A Gene Encoding a Multidrug Resistance Human P-Glycoprotein Homologue on Chromosome 7p15-21 and Uses Thereof

<130> 81994/268611

<160> 19

<170> PatentIn version 3.0

<210> 1

<211> 659

<212> PRT

<213> Homo sapiens

<400> 1

```
Met Leu Ala Glu Lys Gly Ala His Ala Glu Leu Met Ala Lys Arg Gly
1               5                  10                  15

Leu Tyr Tyr Ser Leu Val Met Ser Gln Asp Ile Lys Lys Ala Asp Glu
            20                  25                  30

Gln Met Glu Ser Met Thr Tyr Ser Thr Glu Arg Lys Thr Asn Ser Leu
        35                  40                  45

Pro Leu His Ser Val Lys Ser Ile Lys Ser Asp Phe Ile Asp Lys Ala
    50                  55                  60

Glu Glu Ser Thr Gln Ser Lys Glu Ile Ser Leu Pro Glu Val Ser Leu
65                  70                  75                  80

Leu Lys Ile Leu Lys Leu Asn Lys Pro Glu Trp Pro Phe Val Val Leu
                85                  90                  95

Gly Thr Leu Ala Ser Val Leu Asn Gly Thr Val His Pro Val Phe Ser
            100                 105                 110

Ile Ile Phe Ala Lys Ile Ile Thr Met Phe Gly Asn Asn Asp Lys Thr
        115                 120                 125

Thr Leu Lys His Asp Ala Glu Ile Tyr Ser Met Ile Phe Val Ile Leu
    130                 135                 140

Gly Val Ile Cys Phe Val Ser Tyr Phe Met Gln Gly Leu Phe Tyr Gly
145                 150                 155                 160
```

Arg Ala Gly Glu Ile Leu Thr Met Arg Leu Arg His Leu Ala Phe Lys
165 170 175

Ala Met Leu Tyr Gln Asp Ile Ala Trp Phe Asp Glu Lys Glu Asn Ser
180 185 190

Thr Gly Gly Leu Thr Thr Ile Leu Ala Ile Asp Ile Ala Gln Ile Gln
195 200 205

Gly Ala Thr Gly Ser Arg Ile Gly Val Leu Thr Gln Asn Ala Thr Asn
210 215 220

Met Gly Leu Ser Val Ile Ile Ser Phe Ile Tyr Gly Trp Glu Met Thr
225 230 235 240

Phe Leu Ile Leu Ser Ile Ala Pro Val Leu Ala Val Thr Gly Met Ile
245 250 255

Glu Thr Ala Ala Met Thr Gly Phe Ala Asn Lys Asp Lys Gln Glu Leu
260 265 270

Lys His Ala Gly Lys Ile Ala Thr Glu Ala Leu Glu Asn Ile Arg Thr
275 280 285

Ile Val Ser Leu Thr Arg Glu Lys Ala Phe Glu Gln Met Tyr Glu Glu
290 295 300

Met Leu Gln Thr Gln His Arg Asn Thr Ser Lys Lys Ala Gln Ile Ile
305 310 315 320

Gly Ser Cys Tyr Ala Phe Ser His Ala Phe Ile Tyr Phe Ala Tyr Ala
325 330 335

Ala Gly Phe Arg Phe Gly Ala Tyr Leu Ile Gln Ala Gly Arg Met Thr
340 345 350

Pro Glu Gly Met Phe Ile Val Phe Thr Ala Ile Ala Tyr Gly Ala Met
355 360 365

Ala Ile Gly Lys Thr Leu Val Leu Ala Pro Glu Tyr Ser Lys Ala Lys
370 375 380

Ser Gly Ala Ala His Leu Phe Ala Leu Leu Glu Lys Lys Pro Asn Ile
385 390 395 400

Asp Ser Arg Ser Gln Glu Gly Lys Lys Pro Asp Thr Cys Glu Gly Asn
405 410 415

Leu Glu Phe Arg Glu Val Ser Phe Phe Tyr Pro Cys Arg Pro Asp Val
420 425 430

Phe Ile Leu Arg Gly Leu Ser Leu Ser Ile Glu Arg Gly Lys Thr Val
435 440 445

Ala Phe Val Gly Ser Ser Gly Cys Gly Lys Ser Thr Ser Val Gln Leu
450 455 460

Leu Gln Arg Leu Tyr Asp Pro Val Gln Gly Gln Val Leu Phe Asp Gly
465 470 475 480

Val Asp Ala Lys Glu Leu Asn Val Gln Trp Leu Arg Ser Gln Ile Ala
485 490 495

Ile Val Pro Gln Glu Pro Val Leu Phe Asn Cys Ser Ile Ala Glu Asn
500 505 510

Ile Ala Tyr Gly Asp Asn Ser Arg Val Val Pro Leu Asp Glu Ile Lys
515 520 525

Glu Ala Ala Asn Ala Ala Asn Ile His Ser Phe Ile Glu Gly Leu Pro
530 535 540

Glu Lys Tyr Asn Thr Gln Val Gly Leu Lys Gly Ala Gln Leu Ser Gly
545 550 555 560

Gly Gln Lys Gln Arg Leu Ala Ile Ala Arg Ala Leu Leu Gln Lys Pro
565 570 575

Lys Ile Leu Leu Leu Asp Glu Ala Thr Ser Ala Leu Asp Asn Asp Ser
580 585 590

Glu Lys Val Val Gln His Ala Leu Asp Lys Ala Arg Thr Gly Arg Thr
595 600 605

Cys Leu Val Val Thr His Arg Leu Ser Ala Ile Gln Asn Ala Asp Leu
610 615 620

Ile Val Val Leu His Asn Gly Lys Ile Lys Glu Gln Gly Thr His Gln
625 630 635 640

Glu Leu Leu Arg Asn Arg Asp Ile Tyr Phe Lys Leu Val Asn Ala Gln
645 650 655

Ser Val Gln

<210> 2

<211> 812

<212> PRT

<213> Homo sapiens

<400> 2

Met Val Asp Glu Asn Asp Ile Arg Ala Leu Asn Val Arg His Tyr Arg
1 5 10 15

Asp His Ile Gly Val Val Ser Gln Glu Pro Val Leu Phe Gly Thr Thr
20 25 30

Ile Ser Asn Asn Ile Lys Tyr Gly Arg Asp Asp Val Thr Asp Glu Glu
35 40 45

Met Glu Arg Ala Ala Arg Glu Ala Asn Ala Tyr Asp Phe Ile Met Glu
50 55 60

Phe Pro Asn Lys Phe Asn Thr Leu Val Gly Glu Lys Gly Ala Gln Met
65 70 75 80

Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala Leu Val Arg
85 90 95

Asn Pro Lys Ile Leu Ile Leu Asp Glu Ala Thr Ser Ala Leu Asp Ser
100 105 110

Glu Ser Lys Ser Ala Val Gln Ala Ala Leu Glu Lys Ala Ser Lys Gly
115 120 125

Arg Thr Thr Ile Val Val Ala His Arg Leu Ser Thr Ile Arg Ser Ala
130 135 140

Asp Leu Ile Val Thr Leu Lys Asp Gly Met Leu Ala Glu Lys Gly Ala
145 150 155 160

His Ala Glu Leu Met Ala Lys Arg Gly Leu Tyr Tyr Ser Leu Val Met
165 170 175

Ser Gln Asp Ile Lys Lys Ala Asp Glu Gln Met Glu Ser Met Thr Tyr
180 185 190

Ser Thr Glu Arg Lys Thr Asn Ser Leu Pro Leu His Ser Val Lys Ser
195 200 205

Ile Lys Ser Asp Phe Ile Asp Lys Ala Glu Glu Ser Thr Gln Ser Lys
210 215 220

Glu Ile Ser Leu Pro Glu Val Ser Leu Leu Lys Ile Leu Lys Leu Asn
225 230 235 240

Lys Pro Glu Trp Pro Phe Val Val Leu Gly Thr Leu Ala Ser Val Leu
245 250 255

Asn Gly Thr Val His Pro Val Phe Ser Ile Ile Phe Ala Lys Ile Ile
260 265 270

Thr Met Phe Gly Asn Asn Asp Lys Thr Thr Leu Lys His Asp Ala Glu
275 280 285

Ile Tyr Ser Met Ile Phe Val Ile Leu Gly Val Ile Cys Phe Val Ser
290 295 300

Tyr Phe Met Gln Gly Leu Phe Tyr Gly Arg Ala Gly Glu Ile Leu Thr
305 310 315 320

Met Arg Leu Arg His Leu Ala Phe Lys Ala Met Leu Tyr Gln Asp Ile
325 330 335

Ala Trp Phe Asp Glu Lys Glu Asn Ser Thr Gly Gly Leu Thr Thr Ile
340 345 350

Leu Ala Ile Asp Ile Ala Gln Ile Gln Gly Ala Thr Gly Ser Arg Ile
355 360 365

Gly Val Leu Thr Gln Asn Ala Thr Asn Met Gly Leu Ser Val Ile Ile
370 375 380

Ser Phe Ile Tyr Gly Trp Glu Met Thr Phe Leu Ile Leu Ser Ile Ala
385 390 395 400

Pro Val Leu Ala Val Thr Gly Met Ile Glu Thr Ala Ala Met Thr Gly
405 410 415

Phe Ala Asn Lys Asp Lys Gln Glu Leu Lys His Ala Gly Lys Ile Ala
420 425 430

```
Thr Glu Ala Leu Glu Asn Ile Arg Thr Ile Val Ser Leu Thr Arg Glu
        435                 440                 445

Lys Ala Phe Glu Gln Met Tyr Glu Glu Met Leu Gln Thr Gln His Arg
    450                 455                 460

Asn Thr Ser Lys Lys Ala Gln Ile Ile Gly Ser Cys Tyr Ala Phe Ser
465                 470                 475                 480

His Ala Phe Ile Tyr Phe Ala Tyr Ala Ala Gly Phe Arg Phe Gly Ala
                485                 490                 495

Tyr Leu Ile Gln Ala Gly Arg Met Thr Pro Glu Gly Met Phe Ile Val
            500                 505                 510

Phe Thr Ala Ile Ala Tyr Gly Ala Met Ala Ile Gly Lys Thr Leu Val
        515                 520                 525

Leu Ala Pro Glu Tyr Ser Lys Ala Lys Ser Gly Ala Ala His Leu Phe
    530                 535                 540

Ala Leu Leu Glu Lys Lys Pro Asn Ile Asp Ser Arg Ser Gln Glu Gly
545                 550                 555                 560

Lys Lys Pro Asp Thr Cys Glu Gly Asn Leu Glu Phe Arg Glu Val Ser
                565                 570                 575

Phe Phe Tyr Pro Cys Arg Pro Asp Val Phe Ile Leu Arg Gly Leu Ser
            580                 585                 590

Leu Ser Ile Glu Arg Gly Lys Thr Val Ala Phe Val Gly Ser Ser Gly
        595                 600                 605

Cys Gly Lys Ser Thr Ser Val Gln Leu Leu Gln Arg Leu Tyr Asp Pro
    610                 615                 620

Val Gln Gly Gln Val Leu Phe Asp Gly Val Asp Ala Lys Glu Leu Asn
625                 630                 635                 640

Val Gln Trp Leu Arg Ser Gln Ile Ala Ile Val Pro Gln Glu Pro Val
                645                 650                 655

Leu Phe Asn Cys Ser Ile Ala Glu Asn Ile Ala Tyr Gly Asp Asn Ser
            660                 665                 670

Arg Val Val Pro Leu Asp Glu Ile Lys Glu Ala Ala Asn Ala Ala Asn
        675                 680                 685

Ile His Ser Phe Ile Glu Gly Leu Pro Glu Lys Tyr Asn Thr Gln Val
    690                 695                 700

Gly Leu Lys Gly Ala Gln Leu Ser Gly Gly Gln Lys Gln Arg Leu Ala
705                 710                 715                 720

Ile Ala Arg Ala Leu Leu Gln Lys Pro Lys Ile Leu Leu Leu Asp Glu
                725                 730                 735

Ala Thr Ser Ala Leu Asp Asn Asp Ser Glu Lys Val Val Gln His Ala
            740                 745                 750

Leu Asp Lys Ala Arg Thr Gly Arg Thr Cys Leu Val Val Thr His Arg
        755                 760                 765
```

```
Leu Ser Ala Ile Gln Asn Ala Asp Leu Ile Val Val Leu His Asn Gly
    770                 775                 780

Lys Ile Lys Glu Gln Gly Thr His Gln Glu Leu Leu Arg Asn Arg Asp
785                 790                 795                 800

Ile Tyr Phe Lys Leu Val Asn Ala Gln Ser Val Gln
                805                 810
```

<210> 3

<211> 131

<212> PRT

<213> Homo sapiens

<400> 3

```
Met Val Asp Glu Asn Asp Ile Arg Ala Leu Asn Val Arg His Tyr Arg
1               5                   10                  15

Asp His Ile Gly Val Val Ser Gln Glu Pro Val Leu Phe Gly Thr Thr
            20                  25                  30

Ile Ser Asn Asn Ile Lys Tyr Gly Arg Asp Asp Val Thr Asp Glu Glu
        35                  40                  45

Met Glu Arg Ala Ala Arg Glu Ala Asn Ala Tyr Asp Phe Ile Met Glu
    50                  55                  60

Phe Pro Asn Lys Phe Asn Thr Leu Val Gly Glu Lys Gly Ala Gln Met
65                  70                  75                  80

Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala Leu Val Arg
                85                  90                  95

Asn Pro Lys Ile Leu Ile Leu Asp Glu Ala Thr Ser Ala Leu Asp Ser
            100                 105                 110

Glu Ser Lys Ser Ala Val Gln Ala Ala Leu Glu Lys Asp Thr Pro Arg
        115                 120                 125

Tyr Ser Phe
    130
```

<210> 4

<211> 1058

<212> PRT

<213> Homo sapiens

<220>

<221> Note

<222> (66)..(66)

<223> Xaa at position 66 represents any L amino acid

<400> 4

Met Val Ile Ser Leu Thr Ser Lys Glu Leu Ser Ala Tyr Ser Lys Ala
1   5   10   15

Gly Ala Val Ala Glu Glu Val Leu Ser Ser Ile Arg Thr Val Ile Ala
            20   25   30

Phe Arg Ala Gln Glu Lys Glu Leu Gln Arg Ser Phe Leu Leu Asn Ile
        35   40   45

Thr Arg Tyr Ala Trp Phe Tyr Phe Pro Gln Trp Leu Leu Ser Cys Val
    50   55   60

Leu Xaa Phe Val Arg Tyr Thr Gln Asn Leu Lys Asp Ala Lys Asp Phe
65   70   75   80

Gly Ile Lys Arg Thr Ile Ala Ser Lys Val Ser Leu Gly Ala Val Tyr
                85   90   95

Phe Phe Met Asn Gly Thr Tyr Gly Leu Ala Phe Trp Tyr Gly Thr Ser
            100   105   110

Leu Ile Leu Asn Gly Glu Pro Gly Tyr Thr Ile Gly Thr Val Leu Ala
        115   120   125

Val Phe Phe Ser Val Ile His Ser Ser Tyr Cys Ile Gly Ala Ala Val
    130   135   140

Pro His Phe Glu Thr Phe Ala Ile Ala Arg Gly Ala Ala Phe His Ile
145   150   155   160

Phe Gln Val Ile Asp Lys Lys Pro Ser Ile Asp Asn Phe Ser Thr Ala
                165   170   175

Gly Tyr Lys Pro Glu Ser Ile Glu Gly Thr Val Glu Phe Lys Asn Val
            180   185   190

Ser Phe Asn Tyr Pro Ser Arg Pro Ser Ile Lys Ile Leu Lys Gly Leu
        195   200   205

Asn Leu Arg Ile Lys Ser Gly Glu Thr Val Ala Leu Val Gly Leu Asn
    210   215   220

Gly Ser Gly Lys Ser Thr Val Val Gln Leu Leu Gln Arg Leu Tyr Asp
225   230   235   240

Pro Asp Asp Gly Phe Ile Met Val Asp Glu Asn Asp Ile Arg Ala Leu
                245   250   255

Asn Val Arg His Tyr Arg Asp His Ile Gly Val Val Ser Gln Glu Pro
            260   265   270

Val Leu Phe Gly Thr Thr Ile Ser Asn Asn Ile Lys Tyr Gly Arg Asp
        275   280   285

Asp Val Thr Asp Glu Glu Met Glu Arg Ala Ala Arg Glu Ala Asn Ala
    290   295   300

```
Tyr Asp Phe Ile Met Glu Phe Pro Asn Lys Phe Asn Thr Leu Val Gly
305                 310                 315                 320

Glu Lys Gly Ala Gln Met Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile
                325                 330                 335

Ala Arg Ala Leu Val Arg Asn Pro Lys Ile Leu Ile Leu Asp Glu Ala
            340                 345                 350

Thr Ser Ala Leu Asp Ser Glu Ser Lys Ser Ala Val Gln Ala Ala Leu
        355                 360                 365

Glu Lys Ala Ser Lys Gly Arg Thr Thr Ile Val Val Ala His Arg Leu
    370                 375                 380

Ser Thr Ile Arg Ser Ala Asp Leu Ile Val Thr Leu Lys Asp Gly Met
385                 390                 395                 400

Leu Ala Glu Lys Gly Ala His Ala Glu Leu Met Ala Lys Arg Gly Leu
                405                 410                 415

Tyr Tyr Ser Leu Val Met Ser Gln Asp Ile Lys Lys Ala Asp Glu Gln
            420                 425                 430

Met Glu Ser Met Thr Tyr Ser Thr Glu Arg Lys Thr Asn Ser Leu Pro
        435                 440                 445

Leu His Ser Val Lys Ser Ile Lys Ser Asp Phe Ile Asp Lys Ala Glu
    450                 455                 460

Glu Ser Thr Gln Ser Lys Glu Ile Ser Leu Pro Glu Val Ser Leu Leu
465                 470                 475                 480

Lys Ile Leu Lys Leu Asn Lys Pro Glu Trp Pro Phe Val Val Leu Gly
                485                 490                 495

Thr Leu Ala Ser Val Leu Asn Gly Thr Val His Pro Val Phe Ser Ile
            500                 505                 510

Ile Phe Ala Lys Ile Ile Thr Met Phe Gly Asn Asn Asp Lys Thr Thr
        515                 520                 525

Leu Lys His Asp Ala Glu Ile Tyr Ser Met Ile Phe Val Ile Leu Gly
    530                 535                 540

Val Ile Cys Phe Val Ser Tyr Phe Met Gln Gly Leu Phe Tyr Gly Arg
545                 550                 555                 560

Ala Gly Glu Ile Leu Thr Met Arg Leu Arg His Leu Ala Phe Lys Ala
                565                 570                 575

Met Leu Tyr Gln Asp Ile Ala Trp Phe Asp Glu Lys Glu Asn Ser Thr
            580                 585                 590

Gly Gly Leu Thr Thr Ile Leu Ala Ile Asp Ile Ala Gln Ile Gln Gly
        595                 600                 605

Ala Thr Gly Ser Arg Ile Gly Val Leu Thr Gln Asn Ala Thr Asn Met
    610                 615                 620

Gly Leu Ser Val Ile Ile Ser Phe Ile Tyr Gly Trp Glu Met Thr Phe
625                 630                 635                 640
```

```
Leu Ile Leu Ser Ile Ala Pro Val Leu Ala Val Thr Gly Met Ile Glu
                645                 650                 655

Thr Ala Ala Met Thr Gly Phe Ala Asn Lys Asp Lys Gln Glu Leu Lys
            660                 665                 670

His Ala Gly Lys Ile Ala Thr Glu Ala Leu Glu Asn Ile Arg Thr Ile
        675                 680                 685

Val Ser Leu Thr Arg Glu Lys Ala Phe Glu Gln Met Tyr Glu Glu Met
    690                 695                 700

Leu Gln Thr Gln His Arg Asn Thr Ser Lys Lys Ala Gln Ile Ile Gly
705                 710                 715                 720

Ser Cys Tyr Ala Phe Ser His Ala Phe Ile Tyr Phe Ala Tyr Ala Ala
                725                 730                 735

Gly Phe Arg Phe Gly Ala Tyr Leu Ile Gln Ala Gly Arg Met Thr Pro
            740                 745                 750

Glu Gly Met Phe Ile Val Phe Thr Ala Ile Ala Tyr Gly Ala Met Ala
        755                 760                 765

Ile Gly Lys Thr Leu Val Leu Ala Pro Glu Tyr Ser Lys Ala Lys Ser
    770                 775                 780

Gly Ala Ala His Leu Phe Ala Leu Leu Glu Lys Lys Pro Asn Ile Asp
785                 790                 795                 800

Ser Arg Ser Gln Glu Gly Lys Lys Pro Asp Thr Cys Glu Gly Asn Leu
                805                 810                 815

Glu Phe Arg Glu Val Ser Phe Phe Tyr Pro Cys Arg Pro Asp Val Phe
            820                 825                 830

Ile Leu Arg Gly Leu Ser Leu Ser Ile Glu Arg Gly Lys Thr Val Ala
        835                 840                 845

Phe Val Gly Ser Ser Gly Cys Gly Lys Ser Thr Ser Val Gln Leu Leu
    850                 855                 860

Gln Arg Leu Tyr Asp Pro Val Gln Gly Gln Val Leu Phe Asp Gly Val
865                 870                 875                 880

Asp Ala Lys Glu Leu Asn Val Gln Trp Leu Arg Ser Gln Ile Ala Ile
                885                 890                 895

Val Pro Gln Glu Pro Val Leu Phe Asn Cys Ser Ile Ala Glu Asn Ile
            900                 905                 910

Ala Tyr Gly Asp Asn Ser Arg Val Val Pro Leu Asp Glu Ile Lys Glu
        915                 920                 925

Ala Ala Asn Ala Ala Asn Ile His Ser Phe Ile Glu Gly Leu Pro Glu
    930                 935                 940

Lys Tyr Asn Thr Gln Val Gly Leu Lys Gly Ala Gln Leu Ser Gly Gly
945                 950                 955                 960

Gln Lys Gln Arg Leu Ala Ile Ala Arg Ala Leu Leu Gln Lys Pro Lys
                965                 970                 975
```

Ile Leu Leu Leu Asp Glu Ala Thr Ser Ala Leu Asp Asn Asp Ser Glu
980 985 990

Lys Val Val Gln His Ala Leu Asp Lys Ala Arg Thr Gly Arg Thr Cys
995 1000 1005

Leu Val Val Thr His Arg Leu Ser Ala Ile Gln Asn Ala Asp Leu
1010 1015 1020

Ile Val Val Leu His Asn Gly Lys Ile Lys Glu Gln Gly Thr His
1025 1030 1035

Gln Glu Leu Leu Arg Asn Arg Asp Ile Tyr Phe Lys Leu Val Asn
1040 1045 1050

Ala Gln Ser Val Gln
1055

<210> 5

<211> 1222

<212> PRT

<213> Homo sapiens

<220>

<221> Note

<222> (230)..(230)

<223> Xaa at position 230 represents any L amino acid

<400> 5

Met Ile Leu Gly Ile Leu Ala Ser Leu Val Asn Gly Ala Cys Leu Pro
1 5 10 15

Leu Met Pro Leu Val Leu Gly Glu Met Ser Asp Asn Leu Ile Ser Gly
20 25 30

Cys Leu Val Gln Thr Asn Thr Tyr Ser Phe Phe Arg Leu Thr Leu Tyr
35 40 45

Tyr Val Gly Ile Gly Val Ala Ala Leu Ile Phe Gly Tyr Ile Gln Ile
50 55 60

Ser Leu Trp Ile Ile Thr Ala Ala Arg Gln Thr Lys Arg Ile Arg Lys
65 70 75 80

Gln Phe Phe His Ser Val Leu Ala Gln Asp Ile Gly Trp Phe Asp Ser
85 90 95

Cys Asp Ile Gly Glu Leu Asn Thr Arg Met Thr Asp Ile Asp Lys Ile
100 105 110

Ser Asp Gly Ile Gly Asp Lys Ile Ala Leu Leu Phe Gln Asn Met Ser
115 120 125

```
Thr Phe Ser Ile Gly Leu Ala Val Gly Leu Val Lys Gly Trp Lys Leu
    130                 135                 140

Thr Leu Val Thr Leu Ser Thr Ser Pro Leu Ile Met Ala Ser Ala Ala
145                 150                 155                 160

Ala Cys Ser Arg Met Val Ile Ser Leu Thr Ser Lys Glu Leu Ser Ala
                165                 170                 175

Tyr Ser Lys Ala Gly Ala Val Ala Glu Glu Val Leu Ser Ser Ile Arg
            180                 185                 190

Thr Val Ile Ala Phe Arg Ala Gln Glu Lys Glu Leu Gln Arg Ser Phe
        195                 200                 205

Leu Leu Asn Ile Thr Arg Tyr Ala Trp Phe Tyr Phe Pro Gln Trp Leu
    210                 215                 220

Leu Ser Cys Val Leu Xaa Phe Val Arg Tyr Thr Gln Asn Leu Lys Asp
225                 230                 235                 240

Ala Lys Asp Phe Gly Ile Lys Arg Thr Ile Ala Ser Lys Val Ser Leu
                245                 250                 255

Gly Ala Val Tyr Phe Phe Met Asn Gly Thr Tyr Gly Leu Ala Phe Trp
            260                 265                 270

Tyr Gly Thr Ser Leu Ile Leu Asn Gly Glu Pro Gly Tyr Thr Ile Gly
        275                 280                 285

Thr Val Leu Ala Val Phe Phe Ser Val Ile His Ser Ser Tyr Cys Ile
    290                 295                 300

Gly Ala Ala Val Pro His Phe Glu Thr Phe Ala Ile Ala Arg Gly Ala
305                 310                 315                 320

Ala Phe His Ile Phe Gln Val Ile Asp Lys Lys Pro Ser Ile Asp Asn
                325                 330                 335

Phe Ser Thr Ala Gly Tyr Lys Pro Glu Ser Ile Glu Gly Thr Val Glu
            340                 345                 350

Phe Lys Asn Val Ser Phe Asn Tyr Pro Ser Arg Pro Ser Ile Lys Ile
        355                 360                 365

Leu Lys Gly Leu Asn Leu Arg Ile Lys Ser Gly Glu Thr Val Ala Leu
    370                 375                 380

Val Gly Leu Asn Gly Ser Gly Lys Ser Thr Val Val Gln Leu Leu Gln
385                 390                 395                 400

Arg Leu Tyr Asp Pro Asp Asp Gly Phe Ile Met Val Asp Glu Asn Asp
                405                 410                 415

Ile Arg Ala Leu Asn Val Arg His Tyr Arg Asp His Ile Gly Val Val
            420                 425                 430

Ser Gln Glu Pro Val Leu Phe Gly Thr Thr Ile Ser Asn Asn Ile Lys
        435                 440                 445

Tyr Gly Arg Asp Asp Val Thr Asp Glu Glu Met Glu Arg Ala Ala Arg
    450                 455                 460
```

```
Glu Ala Asn Ala Tyr Asp Phe Ile Met Glu Phe Pro Asn Lys Phe Asn
465                 470                 475                 480

Thr Leu Val Gly Glu Lys Gly Ala Gln Met Ser Gly Gly Gln Lys Gln
                485                 490                 495

Arg Ile Ala Ile Ala Arg Ala Leu Val Arg Asn Pro Lys Ile Leu Ile
            500                 505                 510

Leu Asp Glu Ala Thr Ser Ala Leu Asp Ser Glu Ser Lys Ser Ala Val
        515                 520                 525

Gln Ala Ala Leu Glu Lys Ala Ser Lys Gly Arg Thr Thr Ile Val Val
    530                 535                 540

Ala His Arg Leu Ser Thr Ile Arg Ser Ala Asp Leu Ile Val Thr Leu
545                 550                 555                 560

Lys Asp Gly Met Leu Ala Glu Lys Gly Ala His Ala Glu Leu Met Ala
                565                 570                 575

Lys Arg Gly Leu Tyr Tyr Ser Leu Val Met Ser Gln Asp Ile Lys Lys
            580                 585                 590

Ala Asp Glu Gln Met Glu Ser Met Thr Tyr Ser Thr Glu Arg Lys Thr
        595                 600                 605

Asn Ser Leu Pro Leu His Ser Val Lys Ser Ile Lys Ser Asp Phe Ile
    610                 615                 620

Asp Lys Ala Glu Glu Ser Thr Gln Ser Lys Glu Ile Ser Leu Pro Glu
625                 630                 635                 640

Val Ser Leu Leu Lys Ile Leu Lys Leu Asn Lys Pro Glu Trp Pro Phe
                645                 650                 655

Val Val Leu Gly Thr Leu Ala Ser Val Leu Asn Gly Thr Val His Pro
            660                 665                 670

Val Phe Ser Ile Ile Phe Ala Lys Ile Ile Thr Met Phe Gly Asn Asn
        675                 680                 685

Asp Lys Thr Thr Leu Lys His Asp Ala Glu Ile Tyr Ser Met Ile Phe
    690                 695                 700

Val Ile Leu Gly Val Ile Cys Phe Val Ser Tyr Phe Met Gln Gly Leu
705                 710                 715                 720

Phe Tyr Gly Arg Ala Gly Glu Ile Leu Thr Met Arg Leu Arg His Leu
                725                 730                 735

Ala Phe Lys Ala Met Leu Tyr Gln Asp Ile Ala Trp Phe Asp Glu Lys
            740                 745                 750

Glu Asn Ser Thr Gly Gly Leu Thr Thr Ile Leu Ala Ile Asp Ile Ala
        755                 760                 765

Gln Ile Gln Gly Ala Thr Gly Ser Arg Ile Gly Val Leu Thr Gln Asn
    770                 775                 780

Ala Thr Asn Met Gly Leu Ser Val Ile Ile Ser Phe Ile Tyr Gly Trp
785                 790                 795                 800
```

```
Glu Met Thr Phe Leu Ile Leu Ser Ile Ala Pro Val Leu Ala Val Thr
                805                 810                 815

Gly Met Ile Glu Thr Ala Ala Met Thr Gly Phe Ala Asn Lys Asp Lys
            820                 825                 830

Gln Glu Leu Lys His Ala Gly Lys Ile Ala Thr Glu Ala Leu Glu Asn
        835                 840                 845

Ile Arg Thr Ile Val Ser Leu Thr Arg Glu Lys Ala Phe Glu Gln Met
    850                 855                 860

Tyr Glu Glu Met Leu Gln Thr Gln His Arg Asn Thr Ser Lys Lys Ala
865                 870                 875                 880

Gln Ile Ile Gly Ser Cys Tyr Ala Phe Ser His Ala Phe Ile Tyr Phe
                885                 890                 895

Ala Tyr Ala Ala Gly Phe Arg Phe Gly Ala Tyr Leu Ile Gln Ala Gly
            900                 905                 910

Arg Met Thr Pro Glu Gly Met Phe Ile Val Phe Thr Ala Ile Ala Tyr
        915                 920                 925

Gly Ala Met Ala Ile Gly Lys Thr Leu Val Leu Ala Pro Glu Tyr Ser
    930                 935                 940

Lys Ala Lys Ser Gly Ala Ala His Leu Phe Ala Leu Leu Glu Lys Lys
945                 950                 955                 960

Pro Asn Ile Asp Ser Arg Ser Gln Glu Gly Lys Lys Pro Asp Thr Cys
                965                 970                 975

Glu Gly Asn Leu Glu Phe Arg Glu Val Ser Phe Phe Tyr Pro Cys Arg
            980                 985                 990

Pro Asp Val Phe Ile Leu Arg Gly  Leu Ser Leu Ser Ile  Glu Arg Gly
        995                 1000                1005

Lys Thr  Val Ala Phe Val Gly  Ser Ser Gly Cys Gly  Lys Ser Thr
    1010                1015                1020

Ser Val  Gln Leu Leu Gln Arg  Leu Tyr Asp Pro Val  Gln Gly Gln
    1025                1030                1035

Val Leu  Phe Asp Gly Val Asp  Ala Lys Glu Leu Asn  Val Gln Trp
    1040                1045                1050

Leu Arg  Ser Gln Ile Ala Ile  Val Pro Gln Glu Pro  Val Leu Phe
    1055                1060                1065

Asn Cys  Ser Ile Ala Glu Asn  Ile Ala Tyr Gly Asp  Asn Ser Arg
    1070                1075                1080

Val Val  Pro Leu Asp Glu Ile  Lys Glu Ala Ala Asn  Ala Ala Asn
    1085                1090                1095

Ile His  Ser Phe Ile Glu Gly  Leu Pro Glu Lys Tyr  Asn Thr Gln
    1100                1105                1110

Val Gly  Leu Lys Gly Ala Gln  Leu Ser Gly Gly Gln  Lys Gln Arg
    1115                1120                1125
```

Leu Ala Ile Ala Arg Ala Leu Leu Gln Lys Pro Lys Ile Leu Leu
1130 1135 1140

Leu Asp Glu Ala Thr Ser Ala Leu Asp Asn Asp Ser Glu Lys Val
1145 1150 1155

Val Gln His Ala Leu Asp Lys Ala Arg Thr Gly Arg Thr Cys Leu
1160 1165 1170

Val Val Thr His Arg Leu Ser Ala Ile Gln Asn Ala Asp Leu Ile
1175 1180 1185

Val Val Leu His Asn Gly Lys Ile Lys Glu Gln Gly Thr His Gln
1190 1195 1200

Glu Leu Leu Arg Asn Arg Asp Ile Tyr Phe Lys Leu Val Asn Ala
1205 1210 1215

Gln Ser Val Gln
1220

<210> 6

<211> 1195

<212> PRT

<213> Homo sapiens

<400> 6

Met Ile Leu Gly Ile Leu Ala Ser Leu Val Asn Gly Ala Cys Leu Pro
1 5 10 15

Leu Met Pro Leu Val Leu Gly Glu Met Ser Asp Asn Leu Ile Ser Gly
20 25 30

Cys Leu Val Gln Thr Asn Thr Tyr Ser Phe Phe Arg Leu Thr Leu Tyr
35 40 45

Tyr Val Gly Ile Gly Val Ala Ala Leu Ile Phe Gly Tyr Ile Gln Ile
50 55 60

Ser Leu Trp Ile Ile Thr Ala Ala Arg Gln Thr Lys Arg Ile Arg Lys
65 70 75 80

Gln Phe Phe His Ser Val Leu Ala Gln Asp Ile Gly Trp Phe Asp Ser
85 90 95

Cys Asp Ile Gly Glu Leu Asn Thr Arg Met Thr Asp Ile Asp Lys Ile
100 105 110

Ser Asp Gly Ile Gly Asp Lys Ile Ala Leu Leu Phe Gln Asn Met Ser
115 120 125

Thr Phe Ser Ile Gly Leu Ala Val Gly Leu Val Lys Gly Trp Lys Leu
130 135 140

Thr Leu Val Thr Leu Ser Thr Ser Pro Leu Ile Met Ala Ser Ala Ala
145 150 155 160

```
Ala Cys Ser Arg Met Val Ile Ser Leu Thr Ser Lys Glu Leu Ser Ala
                165                 170                 175

Tyr Ser Lys Ala Gly Ala Val Ala Glu Glu Val Leu Ser Ser Ile Arg
            180                 185                 190

Thr Val Ile Ala Phe Arg Ala Gln Glu Lys Glu Leu Gln Arg Tyr Thr
        195                 200                 205

Gln Asn Leu Lys Asp Ala Lys Asp Phe Gly Ile Lys Arg Thr Ile Ala
    210                 215                 220

Ser Lys Val Ser Leu Gly Ala Val Tyr Phe Phe Met Asn Gly Thr Tyr
225                 230                 235                 240

Gly Leu Ala Phe Trp Tyr Gly Thr Ser Leu Ile Leu Asn Gly Glu Pro
                245                 250                 255

Gly Tyr Thr Ile Gly Thr Val Leu Ala Val Phe Phe Ser Val Ile His
            260                 265                 270

Ser Ser Tyr Cys Ile Gly Ala Ala Val Pro His Phe Glu Thr Phe Ala
        275                 280                 285

Ile Ala Arg Gly Ala Ala Phe His Ile Phe Gln Val Ile Asp Lys Lys
    290                 295                 300

Pro Ser Ile Asp Asn Phe Ser Thr Ala Gly Tyr Lys Pro Glu Ser Ile
305                 310                 315                 320

Glu Gly Thr Val Glu Phe Lys Asn Val Ser Phe Asn Tyr Pro Ser Arg
                325                 330                 335

Pro Ser Ile Lys Ile Leu Lys Gly Leu Asn Leu Arg Ile Lys Ser Gly
            340                 345                 350

Glu Thr Val Ala Leu Val Gly Leu Asn Gly Ser Gly Lys Ser Thr Val
        355                 360                 365

Val Gln Leu Leu Gln Arg Leu Tyr Asp Pro Asp Asp Gly Phe Ile Met
    370                 375                 380

Val Asp Glu Asn Asp Ile Arg Ala Leu Asn Val Arg His Tyr Arg Asp
385                 390                 395                 400

His Ile Gly Val Val Ser Gln Glu Pro Val Leu Phe Gly Thr Thr Ile
                405                 410                 415

Ser Asn Asn Ile Lys Tyr Gly Arg Asp Asp Val Thr Asp Glu Glu Met
            420                 425                 430

Glu Arg Ala Ala Arg Glu Ala Asn Ala Tyr Asp Phe Ile Met Glu Phe
        435                 440                 445

Pro Asn Lys Phe Asn Thr Leu Val Gly Glu Lys Gly Ala Gln Met Ser
    450                 455                 460

Gly Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala Leu Val Arg Asn
465                 470                 475                 480

Pro Lys Ile Leu Ile Leu Asp Glu Ala Thr Ser Ala Leu Asp Ser Glu
                485                 490                 495
```

```
Ser Lys Ser Ala Val Gln Ala Ala Leu Glu Lys Ala Ser Lys Gly Arg
            500                 505                 510

Thr Thr Ile Val Val Ala His Arg Leu Ser Thr Ile Arg Ser Ala Asp
        515                 520                 525

Leu Ile Val Thr Leu Lys Asp Gly Met Leu Ala Glu Lys Gly Ala His
    530                 535                 540

Ala Glu Leu Met Ala Lys Arg Gly Leu Tyr Tyr Ser Leu Val Met Ser
545                 550                 555                 560

Gln Asp Ile Lys Lys Ala Asp Glu Gln Met Glu Ser Met Thr Tyr Ser
                565                 570                 575

Thr Glu Arg Lys Thr Asn Ser Leu Pro Leu His Ser Val Lys Ser Ile
            580                 585                 590

Lys Ser Asp Phe Ile Asp Lys Ala Glu Glu Ser Thr Gln Ser Lys Glu
        595                 600                 605

Ile Ser Leu Pro Glu Val Ser Leu Leu Lys Ile Leu Lys Leu Asn Lys
    610                 615                 620

Pro Glu Trp Pro Phe Val Val Leu Gly Thr Leu Ala Ser Val Leu Asn
625                 630                 635                 640

Gly Thr Val His Pro Val Phe Ser Ile Ile Phe Ala Lys Ile Ile Thr
                645                 650                 655

Met Phe Gly Asn Asn Asp Lys Thr Thr Leu Lys His Asp Ala Glu Ile
            660                 665                 670

Tyr Ser Met Ile Phe Val Ile Leu Gly Val Ile Cys Phe Val Ser Tyr
        675                 680                 685

Phe Met Gln Gly Leu Phe Tyr Gly Arg Ala Gly Glu Ile Leu Thr Met
    690                 695                 700

Arg Leu Arg His Leu Ala Phe Lys Ala Met Leu Tyr Gln Asp Ile Ala
705                 710                 715                 720

Trp Phe Asp Glu Lys Glu Asn Ser Thr Gly Gly Leu Thr Thr Ile Leu
                725                 730                 735

Ala Ile Asp Ile Ala Gln Ile Gln Gly Ala Thr Gly Ser Arg Ile Gly
            740                 745                 750

Val Leu Thr Gln Asn Ala Thr Asn Met Gly Leu Ser Val Ile Ile Ser
        755                 760                 765

Phe Ile Tyr Gly Trp Glu Met Thr Phe Leu Ile Leu Ser Ile Ala Pro
    770                 775                 780

Val Leu Ala Val Thr Gly Met Ile Glu Thr Ala Ala Met Thr Gly Phe
785                 790                 795                 800

Ala Asn Lys Asp Lys Gln Glu Leu Lys His Ala Gly Lys Ile Ala Thr
                805                 810                 815

Glu Ala Leu Glu Asn Ile Arg Thr Ile Val Ser Leu Thr Arg Glu Lys
            820                 825                 830
```

```
Ala Phe Glu Gln Met Tyr Glu Glu Met Leu Gln Thr Gln His Arg Asn
        835                 840                 845

Thr Ser Lys Lys Ala Gln Ile Ile Gly Ser Cys Tyr Ala Phe Ser His
    850                 855                 860

Ala Phe Ile Tyr Phe Ala Tyr Ala Ala Gly Phe Arg Phe Gly Ala Tyr
865                 870                 875                 880

Leu Ile Gln Ala Gly Arg Met Thr Pro Glu Gly Met Phe Ile Val Phe
                885                 890                 895

Thr Ala Ile Ala Tyr Gly Ala Met Ala Ile Gly Lys Thr Leu Val Leu
            900                 905                 910

Ala Pro Glu Tyr Ser Lys Ala Lys Ser Gly Ala Ala His Leu Phe Ala
        915                 920                 925

Leu Leu Glu Lys Lys Pro Asn Ile Asp Ser Arg Ser Gln Glu Gly Lys
    930                 935                 940

Lys Pro Asp Thr Cys Glu Gly Asn Leu Glu Phe Arg Glu Val Ser Phe
945                 950                 955                 960

Phe Tyr Pro Cys Arg Pro Asp Val Phe Ile Leu Arg Gly Leu Ser Leu
                965                 970                 975

Ser Ile Glu Arg Gly Lys Thr Val Ala Phe Val Gly Ser Ser Gly Cys
            980                 985                 990

Gly Lys Ser Thr Ser Val Gln Leu  Leu Gln Arg Leu Tyr  Asp Pro Val
        995                 1000                1005

Gln Gly  Gln Val Leu Phe Asp  Gly Val Asp Ala Lys  Glu Leu Asn
    1010                1015                1020

Val Gln  Trp Leu Arg Ser Gln  Ile Ala Ile Val Pro  Gln Glu Pro
    1025                1030                1035

Val Leu  Phe Asn Cys Ser Ile  Ala Glu Asn Ile Ala  Tyr Gly Asp
    1040                1045                1050

Asn Ser  Arg Val Val Pro Leu  Asp Glu Ile Lys Glu  Ala Ala Asn
    1055                1060                1065

Ala Ala  Asn Ile His Ser Phe  Ile Glu Gly Leu Pro  Glu Lys Tyr
    1070                1075                1080

Asn Thr  Gln Val Gly Leu Lys  Gly Ala Gln Leu Ser  Gly Gly Gln
    1085                1090                1095

Lys Gln  Arg Leu Ala Ile Ala  Arg Ala Leu Leu Gln  Lys Pro Lys
    1100                1105                1110

Ile Leu  Leu Leu Asp Glu Ala  Thr Ser Ala Leu Asp  Asn Asp Ser
    1115                1120                1125

Glu Lys  Val Val Gln His Ala  Leu Asp Lys Ala Arg  Thr Gly Arg
    1130                1135                1140

Thr Cys  Leu Val Val Thr His  Arg Leu Ser Ala Ile  Gln Asn Ala
    1145                1150                1155
```

```
Asp Leu  Ile Val Val Leu His  Asn Gly Lys Ile Lys  Glu Gln Gly
    1160                 1165                 1170

Thr His  Gln Glu Leu Leu Arg  Asn Arg Asp Ile Tyr  Phe Lys Leu
    1175                 1180                 1185

Val Asn  Ala Gln Ser Val Gln
    1190                 1195
```

<210> 7

<211> 541

<212> PRT

<213> Homo sapiens

<220>

<221> Note

<222> (230)..(230)

<223> Xaa at position 230 represents any L amino acid

<400> 7

```
Met Ile Leu Gly Ile Leu Ala Ser Leu Val Asn Gly Ala Cys Leu Pro
1               5                  10                  15

Leu Met Pro Leu Val Leu Gly Glu Met Ser Asp Asn Leu Ile Ser Gly
            20                  25                  30

Cys Leu Val Gln Thr Asn Thr Tyr Ser Phe Phe Arg Leu Thr Leu Tyr
        35                  40                  45

Tyr Val Gly Ile Gly Val Ala Ala Leu Ile Phe Gly Tyr Ile Gln Ile
    50                  55                  60

Ser Leu Trp Ile Ile Thr Ala Ala Arg Gln Thr Lys Arg Ile Arg Lys
65                  70                  75                  80

Gln Phe Phe His Ser Val Leu Ala Gln Asp Ile Gly Trp Phe Asp Ser
                85                  90                  95

Cys Asp Ile Gly Glu Leu Asn Thr Arg Met Thr Asp Ile Asp Lys Ile
            100                 105                 110

Ser Asp Gly Ile Gly Asp Lys Ile Ala Leu Leu Phe Gln Asn Met Ser
        115                 120                 125

Thr Phe Ser Ile Gly Leu Ala Val Gly Leu Val Lys Gly Trp Lys Leu
    130                 135                 140

Thr Leu Val Thr Leu Ser Thr Ser Pro Leu Ile Met Ala Ser Ala Ala
145                 150                 155                 160

Ala Cys Ser Arg Met Val Ile Ser Leu Thr Ser Lys Glu Leu Ser Ala
                165                 170                 175
```

```
Tyr Ser Lys Ala Gly Ala Val Ala Glu Glu Val Leu Ser Ser Ile Arg
            180                 185                 190

Thr Val Ile Ala Phe Arg Ala Gln Glu Lys Glu Leu Gln Arg Ser Phe
        195                 200                 205

Leu Leu Asn Ile Thr Arg Tyr Ala Trp Phe Tyr Phe Pro Gln Trp Leu
    210                 215                 220

Leu Ser Cys Val Leu Xaa Phe Val Arg Tyr Thr Gln Asn Leu Lys Asp
225                 230                 235                 240

Ala Lys Asp Phe Gly Ile Lys Arg Thr Ile Ala Ser Lys Val Ser Leu
                245                 250                 255

Gly Ala Val Tyr Phe Phe Met Asn Gly Thr Tyr Gly Leu Ala Phe Trp
            260                 265                 270

Tyr Gly Thr Ser Leu Ile Leu Asn Gly Glu Pro Gly Tyr Thr Ile Gly
        275                 280                 285

Thr Val Leu Ala Val Phe Phe Ser Val Ile His Ser Ser Tyr Cys Ile
    290                 295                 300

Gly Ala Ala Val Pro His Phe Glu Thr Phe Ala Ile Ala Arg Gly Ala
305                 310                 315                 320

Ala Phe His Ile Phe Gln Val Ile Asp Lys Lys Pro Ser Ile Asp Asn
                325                 330                 335

Phe Ser Thr Ala Gly Tyr Lys Pro Glu Ser Ile Glu Gly Thr Val Glu
            340                 345                 350

Phe Lys Asn Val Ser Phe Asn Tyr Pro Ser Arg Pro Ser Ile Lys Ile
        355                 360                 365

Leu Lys Gly Leu Asn Leu Arg Ile Lys Ser Gly Glu Thr Val Ala Leu
    370                 375                 380

Val Gly Leu Asn Gly Ser Gly Lys Ser Thr Val Val Gln Leu Leu Gln
385                 390                 395                 400

Arg Leu Tyr Asp Pro Asp Asp Gly Phe Ile Met Val Asp Glu Asn Asp
                405                 410                 415

Ile Arg Ala Leu Asn Val Arg His Tyr Arg Asp His Ile Gly Val Val
            420                 425                 430

Ser Gln Glu Pro Val Leu Phe Gly Thr Thr Ile Ser Asn Asn Ile Lys
        435                 440                 445

Tyr Gly Arg Asp Asp Val Thr Asp Glu Glu Met Glu Arg Ala Ala Arg
    450                 455                 460

Glu Ala Asn Ala Tyr Asp Phe Ile Met Glu Phe Pro Asn Lys Phe Asn
465                 470                 475                 480

Thr Leu Val Gly Glu Lys Gly Ala Gln Met Ser Gly Gly Gln Lys Gln
                485                 490                 495

Arg Ile Ala Ile Ala Arg Ala Leu Val Arg Asn Pro Lys Ile Leu Ile
            500                 505                 510
```

Leu Asp Glu Ala Thr Ser Ala Leu Asp Ser Glu Ser Lys Ser Ala Val
515 520 525

Gln Ala Ala Leu Glu Lys Asp Thr Pro Arg Tyr Ser Phe
530 535 540

<210> 8

<211> 514

<212> PRT

<213> Homo sapiens

<400> 8

Met Ile Leu Gly Ile Leu Ala Ser Leu Val Asn Gly Ala Cys Leu Pro
1 5 10 15

Leu Met Pro Leu Val Leu Gly Glu Met Ser Asp Asn Leu Ile Ser Gly
20 25 30

Cys Leu Val Gln Thr Asn Thr Tyr Ser Phe Phe Arg Leu Thr Leu Tyr
35 40 45

Tyr Val Gly Ile Gly Val Ala Ala Leu Ile Phe Gly Tyr Ile Gln Ile
50 55 60

Ser Leu Trp Ile Ile Thr Ala Ala Arg Gln Thr Lys Arg Ile Arg Lys
65 70 75 80

Gln Phe Phe His Ser Val Leu Ala Gln Asp Ile Gly Trp Phe Asp Ser
85 90 95

Cys Asp Ile Gly Glu Leu Asn Thr Arg Met Thr Asp Ile Asp Lys Ile
100 105 110

Ser Asp Gly Ile Gly Asp Lys Ile Ala Leu Leu Phe Gln Asn Met Ser
115 120 125

Thr Phe Ser Ile Gly Leu Ala Val Gly Leu Val Lys Gly Trp Lys Leu
130 135 140

Thr Leu Val Thr Leu Ser Thr Ser Pro Leu Ile Met Ala Ser Ala Ala
145 150 155 160

Ala Cys Ser Arg Met Val Ile Ser Leu Thr Ser Lys Glu Leu Ser Ala
165 170 175

Tyr Ser Lys Ala Gly Ala Val Ala Glu Glu Val Leu Ser Ser Ile Arg
180 185 190

Thr Val Ile Ala Phe Arg Ala Gln Glu Lys Glu Leu Gln Arg Tyr Thr
195 200 205

Gln Asn Leu Lys Asp Ala Lys Asp Phe Gly Ile Lys Arg Thr Ile Ala
210 215 220

Ser Lys Val Ser Leu Gly Ala Val Tyr Phe Phe Met Asn Gly Thr Tyr
225 230 235 240

Gly Leu Ala Phe Trp Tyr Gly Thr Ser Leu Ile Leu Asn Gly Glu Pro
245 250 255

Gly Tyr Thr Ile Gly Thr Val Leu Ala Val Phe Phe Ser Val Ile His
260 265 270

Ser Ser Tyr Cys Ile Gly Ala Ala Val Pro His Phe Glu Thr Phe Ala
275 280 285

Ile Ala Arg Gly Ala Ala Phe His Ile Phe Gln Val Ile Asp Lys Lys
290 295 300

Pro Ser Ile Asp Asn Phe Ser Thr Ala Gly Tyr Lys Pro Glu Ser Ile
305 310 315 320

Glu Gly Thr Val Glu Phe Lys Asn Val Ser Phe Asn Tyr Pro Ser Arg
325 330 335

Pro Ser Ile Lys Ile Leu Lys Gly Leu Asn Leu Arg Ile Lys Ser Gly
340 345 350

Glu Thr Val Ala Leu Val Gly Leu Asn Gly Ser Gly Lys Ser Thr Val
355 360 365

Val Gln Leu Leu Gln Arg Leu Tyr Asp Pro Asp Asp Gly Phe Ile Met
370 375 380

Val Asp Glu Asn Asp Ile Arg Ala Leu Asn Val Arg His Tyr Arg Asp
385 390 395 400

His Ile Gly Val Val Ser Gln Glu Pro Val Leu Phe Gly Thr Thr Ile
405 410 415

Ser Asn Asn Ile Lys Tyr Gly Arg Asp Asp Val Thr Asp Glu Glu Met
420 425 430

Glu Arg Ala Ala Arg Glu Ala Asn Ala Tyr Asp Phe Ile Met Glu Phe
435 440 445

Pro Asn Lys Phe Asn Thr Leu Val Gly Glu Lys Gly Ala Gln Met Ser
450 455 460

Gly Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala Leu Val Arg Asn
465 470 475 480

Pro Lys Ile Leu Ile Leu Asp Glu Ala Thr Ser Ala Leu Asp Ser Glu
485 490 495

Ser Lys Ser Ala Val Gln Ala Ala Leu Glu Lys Asp Thr Pro Arg Tyr
500 505 510

Ser Phe

<210> 9

<211> 2066

<212> DNA

<213> Homo sapiens

<400> 9

```
cgagcaaagg tcggactaca atcgtggtag cacaccgact ttctactatt cgaagtgcag 60
atttgattgt gaccctaaag gatggaatgc tggcggagaa aggagcacat gctgaactaa 120
tggcaaaacg aggtctatat tattcacttg tgatgtcaca ggatattaaa aaagctgatg 180
aacagatgga gtcaatgaca tattctactg aaagaaagac caactcactt cctctgcact 240
ctgtgaagag catcaagtca gacttcattg acaaggctga ggaatccacc caatctaaag 300
agataagtct tcctgaagtc tctctattaa aaattttaaa gttaaacaag cctgaatggc 360
cttttgtggt tctggggaca ttggcttctg ttctaaatgg aactgttcat ccagtatttt 420
ccatcatctt tgcaaaaatt ataaccatgt ttggaaataa tgataaaacc acattaaagc 480
atgatgcaga aatttattcc atgatattcg tcattttggg tgttatttgc tttgtcagtt 540
atttcatgca gggattattt tacggcagag caggggaaat tttaacgatg agattaagac 600
acttggcctt caaagccatg ttatatcagg atattgcctg gtttgatgaa aaggaaaaca 660
gcacaggagg cttgacaaca atattagcca tagatatagc acaaattcaa ggagcaacag 720
gttccaggat tggcgtctta acacaaaatg caactaacat gggactttca gttatcattt 780
cctttatata tggatgggag atgacattcc tgattctgag tattgctcca gtacttgccg 840
tgacaggaat gattgaaacc gcagcaatga ctggatttgc caacaaagat aagcaagaac 900
ttaagcatgc tggaaagata gcaactgaag ctttggagaa tatacgtact atagtgtcat 960
taacaaggga aaaagccttc gagcaaatgt atgaagagat gcttcagact caacacagaa 1020
atacctcgaa gaaagcacag attattggaa gctgttatgc attcagccat gcctttatat 1080
attttgccta tgcagcaggg tttcgatttg gagcctattt aattcaagct ggacgaatga 1140
ccccagaggg catgttcata gtttttactg caattgcata tggagctatg gccatcggaa 1200
aaacgctcgt tttggctcct gaatattcca aagccaaatc gggggctgcg catctgtttg 1260
ccttgttgga aaagaaacca aatatagaca gccgcagtca agaagggaaa aagccagaca 1320
catgtgaagg gaatttagag tttcgagaag tctctttctt ctatccatgt cgcccagatg 1380
ttttcatcct ccgtggctta tccctcagta ttgagcgagg aaagacagta gcatttgtgg 1440
ggagcagcgg ctgtgggaaa agcacttctg ttcaacttct gcagagactt tatgaccccg 1500
tgcaaggaca agtgctgttt gatggtgtgg atgcaaaaga attgaatgta cagtggctcc 1560
gttcccaaat agcaatcgtt cctcaagagc ctgtgctctt caactgcagc attgctgaga 1620
acatcgccta tggtgacaac agccgtgtgg tgccattaga tgagatcaaa gaagccgcaa 1680
atgcagcaaa tatccattct tttattgaag gtctccctga gaaatacaac acacaagttg 1740
gactgaaagg agcacagctt tctggcggcc agaaacaaag actagctatt gcaagggctc 1800
ttctccaaaa acccaaaatt ttattgttgg atgaggccac ttcagccctc gataatgaca 1860
```

gtgagaaggt ggttcagcat gcccttgata aagccaggac gggaaggaca tgcctagtgg 1920

tcactcacag gctctctgca attcagaacg cagatttgat agtggttctg cacaatggaa 1980

agataaagga acaaggaact catcaagagc tcctgagaaa tcgagacata tattttaagt 2040

tagtgaatgc acagtcagtg cagtga 2066

<210> 10

<211> 2856

<212> DNA

<213> Homo sapiens

<400> 10

cctaattcct ctaatatctc tctgtgagcc taaaccaata attatatatt acattctatt 60

gtctttctta tataactgca gaaagataaa tatcactttg tttgttcctg taggttttct 120

ttagtgtaat ccatagcagt tattgcattg gagcagcagt ccctcattat tgataagaaa 180

cccagtatag ataacttttc cacagctgga tataaacctg aatccataga aggaactgtg 240

gaatttaaaa atgtttcttt caattatcca tcaagaccat ctatcaagat tctgaaaggt 300

ctgaatctca gaattaagtc tggagagaca gtcgccttgg tcggtctcaa tggcagtggg 360

aagagtacgg tagtccagct tctgcagagg ttatatgatc cggatgatgg ctttatcatg 420

gtggatgaga atgacatcag agctttaaat gtgcggcatt atcgagacca tattggagtg 480

gttagtcaag agcctgtttt gttcgggacc accatcagta acaatatcaa gtatggacga 540

gatgatgtga ctgatgaaga gatggagaga gcagcaaggg aagcaaatgc gtatgatttt 600

atcatggagt ttcctaataa atttaataca ttggtagggg aaaaaggagc tcaaatgagt 660

ggagggcaga aacagaggat cgcaattgct cgtgccttag ttcgaaaccc caagattctg 720

attttagatg aggctacgtc tgccctggat tcagaaagca agtcagctgt tcaagctgca 780

ctggagaagg cgagcaaagg tcggactaca atcgtggtag cacaccgact ttctactatt 840

cgaagtgcag atttgattgt gaccctaaag gatggaatgc tggcggagaa aggagcacat 900

gctgaactaa tggcaaaacg aggtctatat tattcacttg tgatgtcaca ggatattaaa 960

aaagctgatg aacagatgga gtcaatgaca tattctactg aaagaaagac caactcactt 1020

cctctgcact ctgtgaagag catcaagtca gacttcattg acaaggctga ggaatccacc 1080

caatctaaag agataagtct tcctgaagtc tctctattaa aaattttaaa gttaaacaag 1140

cctgaatggc cttttgtggt tctggggaca ttggcttctg ttctaaatgg aactgttcat 1200

ccagtatttt ccatcatctt tgcaaaaatt ataaccatgt ttggaaataa tgataaaacc 1260

acattaaagc atgatgcaga aatttattcc atgatattcg tcattttggg tgttatttgc 1320

tttgtcagtt atttcatgca gggattattt tacggcagag caggggaaat tttaacgatg 1380
agattaagac acttggcctt caaagccatg ttatatcagg atattgcctg gtttgatgaa 1440
aaggaaaaca gcacaggagg cttgacaaca atattagcca tagatatagc acaaattcaa 1500
ggagcaacag gttccaggat tggcgtctta acacaaaatg caactaacat gggactttca 1560
gttatcattt cctttatata tggatgggag atgacattcc tgattctgag tattgctcca 1620
gtacttgccg tgacaggaat gattgaaacc gcagcaatga ctggatttgc caacaaagat 1680
aagcaagaac ttaagcatgc tggaaagata gcaactgaag ctttggagaa tatacgtact 1740
atagtgtcat taacaaggga aaaagccttc gagcaaatgt atgaagagat gcttcagact 1800
caacacagaa atacctcgaa gaaagcacag attattggaa gctgttatgc attcagccat 1860
gcctttatat attttgccta tgcagcaggg tttcgatttg gagcctattt aattcaagct 1920
ggacgaatga ccccagaggg catgttcata gtttttactg caattgcata tggagctatg 1980
gccatcggaa aaacgctcgt tttggctcct gaatattcca aagccaaatc gggggctgcg 2040
catctgtttg ccttgttgga aaagaaacca aatatagaca gccgcagtca agaagggaaa 2100
aagccagaca catgtgaagg gaatttagag tttcgagaag tctctttctt ctatccatgt 2160
cgcccagatg ttttcatcct ccgtggctta tccctcagta ttgagcgagg aaagacagta 2220
gcatttgtgg ggagcagcgg ctgtgggaaa agcacttctg ttcaacttct gcagagactt 2280
tatgaccccg tgcaaggaca agtgctgttt gatggtgtgg atgcaaaaga attgaatgta 2340
cagtggctcc gttcccaaat agcaatcgtt cctcaagagc ctgtgctctt caactgcagc 2400
attgctgaga acatcgccta tggtgacaac agccgtgtgg tgccattaga tgagatcaaa 2460
gaagccgcaa atgcagcaaa tatccattct tttattgaag gtctccctga gaaatacaac 2520
acacaagttg gactgaaagg agcacagctt tctggcggcc agaaacaaag actagctatt 2580
gcaagggctc ttctccaaaa acccaaaatt ttattgttgg atgaggccac ttcagccctc 2640
gataatgaca gtgagaaggt ggttcagcat gcccttgata aagccaggac gggaaggaca 2700
tgcctagtgg tcactcacag gctctctgca attcagaacg cagatttgat agtggttctg 2760
cacaatggaa agataaagga acaaggaact catcaagagc tcctgagaaa tcgagacata 2820
tattttaagt tagtgaatgc acagtcagtg cagtga 2856

<210> 11

<211> 1175

<212> DNA

<213> Homo sapiens

<400> 11
cctaattcct ctaatatctc tctgtgagcc taaaccaata attatatatt acattctatt 60

gtctttctta tataactgca gaaagataaa tatcactttg tttgttcctg taggttttct 120

ttagtgtaat ccatagcagt tattgcattg gagcagcagt ccctcattat tgataagaaa 180

cccagtatag ataacttttc cacagctgga tataaacctg aatccataga aggaactgtg 240

gaatttaaaa atgtttcttt caattatcca tcaagaccat ctatcaagat tctgaaaggt 300

ctgaatctca gaattaagtc tggagagaca gtcgccttgg tcggtctcaa tggcagtggg 360

aagagtacgg tagtccagct tctgcagagg ttatatgatc cggatgatgg ctttatcatg 420

gtggatgaga atgacatcag agctttaaat gtgcggcatt atcgagacca tattggagtg 480

gttagtcaag agcctgtttt gttcgggacc accatcagta acaatatcaa gtatggacga 540

gatgatgtga ctgatgaaga gatggagaga gcagcaaggg aagcaaatgc gtatgatttt 600

atcatggagt ttcctaataa atttaataca ttggtagggg aaaaaggagc tcaaatgagt 660

ggagggcaga aacagaggat cgcaattgct cgtgccttag ttcgaaaccc caagattctg 720

attttagatg aggctacgtc tgccctggat tcagaaagca agtcagctgt tcaagctgca 780

ctggagaagg ataccccccag gtattcattt tgacctaatt tcacctcaag tggagaatcg 840

ctgaccttga accagcgccc ttcgacagct ctggcccctc aaacctcacc ctgacctcct 900

gctgcctatg agctactgca catacctcaa ggccatatgc agttgtggcc ctgcaccaaa 960

ttacactgaa tctaggaggg gagttggcag tggcggtatg aaaaaccatt gaacagtttt 1020

ctcgatggcc tgactccctt ataaaccaga gccttcagac cccttacaag gcttaatggc 1080

acattttact ttgcatttgc ttggaagtga gttaagcgtt ttttttctc taagaaaatc 1140

gcaggcttct ttttttaaaa tgctgacttt atgga 1175

<210> 12

<211> 3177

<212> DNA

<213> Homo sapiens

<220>

<221> Note

<222> (198)..(198)

<223> n at position 198 represents any nucleotide (A, T, C or G)

<400> 12

atggtcatct cattgaccag taaggaatta agtgcctatt ccaaagctgg ggctgtggca 60

gaagaagtct tgtcatcaat ccgaacagtc atagccttta gggcccagga gaaagaactt 120

caaaggtctt tccttttaaa tataacaaga tatgcttggt tttattttcc ccagtggcta 180

ctaagttgtg ttctgttntt tgtaaggtat acacagaatc tcaaagatgc aaaggatttt 240

ggcataaaaa ggactatagc ttcaaaagtg tctcttggtg ctgtgtactt ctttatgaat 300

ggaacctatg gacttgcttt ttggtatgga acctccttga ttcttaatgg agaacctgga 360

tataccatcg ggactgttct tgctgttttc tttagtgtaa tccatagcag ttattgcatt 420

ggagcagcag tccctcactt tgaaaccttc gcaatagccc gaggagctgc ctttcatatt 480

ttccaggtta ttgataagaa acccagtata gataactttt ccacagctgg atataaacct 540

gaatccatag aaggaactgt ggaatttaaa aatgtttctt tcaattatcc atcaagacca 600

tctatcaaga ttctgaaagg tctgaatctc agaattaagt ctggagagac agtcgccttg 660

gtcggtctca atggcagtgg gaagagtacg gtagtccagc ttctgcagag gttatatgat 720

ccggatgatg gctttatcat ggtggatgag aatgacatca gagctttaaa tgtgcggcat 780

tatcgagacc atattggagt ggttagtcaa gagcctgttt tgttcgggac caccatcagt 840

aacaatatca agtatggacg agatgatgtg actgatgaag agatggagag agcagcaagg 900

gaagcaaatg cgtatgattt tatcatggag tttcctaata aatttaatac attggtaggg 960

gaaaaaggag ctcaaatgag tggagggcag aaacagagga tcgcaattgc tcgtgcctta 1020

gttcgaaacc ccaagattct gattttagat gaggctacgt ctgccctgga ttcagaaagc 1080

aagtcagctg ttcaagctgc actggagaag gcgagcaaag gtcggactac aatcgtggta 1140

gcacaccgac tttctactat tcgaagtgca gatttgattg tgaccctaaa ggatggaatg 1200

ctggcggaga aaggagcaca tgctgaacta atggcaaaac gaggtctata ttattcactt 1260

gtgatgtcac aggatattaa aaaagctgat gaacagatgg agtcaatgac atattctact 1320

gaaagaaaga ccaactcact tcctctgcac tctgtgaaga gcatcaagtc agacttcatt 1380

gacaaggctg aggaatccac ccaatctaaa gagataagtc ttcctgaagt ctctctatta 1440

aaaatttaa agttaaacaa gcctgaatgg ccttttgtgg ttctggggac attggcttct 1500

gttctaaatg gaactgttca tccagtattt tccatcatct ttgcaaaaat tataaccatg 1560

tttggaaata atgataaaac cacattaaag catgatgcag aaatttattc catgatattc 1620

gtcattttgg gtgttatttg ctttgtcagt tatttcatgc agggattatt ttacggcaga 1680

gcaggggaaa ttttaacgat gagattaaga cacttggcct tcaaagccat gttatatcag 1740

gatattgcct ggtttgatga aaaggaaaac agcacaggag gcttgacaac aatattagcc 1800

atagatatag cacaaattca aggagcaaca ggttccagga ttggcgtctt aacacaaaat 1860

gcaactaaca tgggactttc agttatcatt tcctttatat atggatggga gatgacattc 1920

ctgattctga gtattgctcc agtacttgcc gtgacaggaa tgattgaaac cgcagcaatg 1980

actggatttg ccaacaaaga taagcaagaa cttaagcatg ctggaaagat agcaactgaa 2040

gctttggaga atatacgtac tatagtgtca ttaacaaggg aaaaagcctt cgagcaaatg 2100

tatgaagaga tgcttcagac tcaacacaga aatacctcga agaaagcaca gattattgga 2160

agctgttatg cattcagcca tgcctttata tattttgcct atgcagcagg gtttcgattt 2220

ggagcctatt taattcaagc tggacgaatg accccagagg gcatgttcat agtttttact 2280

gcaattgcat atggagctat ggccatcgga aaaacgctcg ttttggctcc tgaatattcc 2340

aaagccaaat cgggggctgc gcatctgttt gccttgttgg aaaagaaacc aaatatagac 2400

agccgcagtc aagaagggaa aaagccagac acatgtgaag ggaatttaga gtttcgagaa 2460

gtctctttct tctatccatg tcgcccagat gttttcatcc tccgtggctt atccctcagt 2520

attgagcgag gaaagacagt agcatttgtg gggagcagcg gctgtgggaa aagcacttct 2580

gttcaacttc tgcagagact ttatgacccc gtgcaaggac aagtgctgtt tgatggtgtg 2640

gatgcaaaag aattgaatgt acagtggctc cgttcccaaa tagcaatcgt tcctcaagag 2700

cctgtgctct tcaactgcag cattgctgag aacatcgcct atggtgacaa cagccgtgtg 2760

gtgccattag atgagatcaa agaagccgca aatgcagcaa atatccattc ttttattgaa 2820

ggtctccctg agaaatacaa cacacaagtt ggactgaaag gagcacagct ttctggcggc 2880

cagaaacaaa gactagctat tgcaagggct cttctccaaa aacccaaaat tttattgttg 2940

gatgaggcca cttcagccct cgataatgac agtgagaagg tggttcagca tgcccttgat 3000

aaagccagga cgggaaggac atgcctagtg gtcactcaca ggctctctgc aattcagaac 3060

gcagatttga tagtggttct gcacaatgga aagataaagg aacaaggaac tcatcaagag 3120

ctcctgagaa atcgagacat atattttaag ttagtgaatg cacagtcagt gcagtga 3177

<210> 13

<211> 3702

<212> DNA

<213> Homo sapiens

<220>

<221> Note

<222> (723)..(723)

<223> n at position 723 represents any nucleotide (A, T, C or G)

<400> 13

ttccgctttg ctgatggact ggacatcaca ctcatgatcc tgggtatact ggcatcactg 60

gtcaatggag cctgccttcc tttaatgcca ctggttttag gagaaatgag tgataacctt 120

attagtggat gtctagtcca aactaacaca tactctttct tcaggttgac cctgtattat 180

gttggaatag gtgttgctgc cttgattttt ggttacatac agatttcctt gtggattata 240

actgcagcac gacagaccaa gaggattcga aaacagtttt ttcattcagt tttggcacag 300

gacatcggct ggtttgatag ctgtgacatc ggtgaactta acactcgcat gacagacatt 360

gacaaaatca gtgatggtat tggagataag attgctctgt tgtttcaaaa catgtctact 420

ttttcgattg gcctggcagt tggtttggtg aagggctgga aactcaccct agtgactcta 480

tccacgtctc ctcttataat ggcttcagcg gcagcatgtt ctaggatggt catctcattg 540

accagtaagg aattaagtgc ctattccaaa gctggggctg tggcagaaga agtcttgtca 600

tcaatccgaa cagtcatagc ctttagggcc caggagaaag aacttcaaag gtctttcctt 660

ttaaatataa caagatatgc ttggttttat tttccccagt ggctactaag ttgtgttctg 720

ttntttgtaa ggtatacaca gaatctcaaa gatgcaaagg attttggcat aaaaaggact 780

atagcttcaa aagtgtctct tggtgctgtg tacttcttta tgaatggaac ctatggactt 840

gctttttggt atggaacctc cttgattctt aatggagaac ctggatatac catcgggact 900

gttcttgctg ttttctttag tgtaatccat agcagttatt gcattggagc agcagtccct 960

cactttgaaa ccttcgcaat agcccgagga gctgcctttc atattttcca ggttattgat 1020

aagaaaccca gtatagataa cttttccaca gctggatata aacctgaatc catagaagga 1080

actgtggaat ttaaaaatgt ttctttcaat tatccatcaa gaccatctat caagattctg 1140

aaaggtctga atctcagaat taagtctgga gagacagtcg ccttggtcgg tctcaatggc 1200

agtgggaaga gtacggtagt ccagcttctg cagaggttat atgatccgga tgatggcttt 1260

atcatggtgg atgagaatga catcagagct ttaaatgtgc ggcattatcg agaccatatt 1320

ggagtggtta gtcaagagcc tgttttgttc gggaccacca tcagtaacaa tatcaagtat 1380

ggacgagatg atgtgactga tgaagagatg gagagagcag caagggaagc aaatgcgtat 1440

gattttatca tggagtttcc taataaattt aatacattgg taggggaaaa aggagctcaa 1500

atgagtggag ggcagaaaca gaggatcgca attgctcgtg ccttagttcg aaaccccaag 1560

attctgattt tagatgaggc tacgtctgcc ctggattcag aaagcaagtc agctgttcaa 1620

gctgcactgg agaaggcgag caaaggtcgg actacaatcg tggtagcaca ccgactttct 1680

actattcgaa gtgcagattt gattgtgacc ctaaaggatg gaatgctggc ggagaaagga 1740

gcacatgctg aactaatggc aaaacgaggt ctatattatt cacttgtgat gtcacaggat 1800

attaaaaaag ctgatgaaca gatggagtca atgacatatt ctactgaaag aaagaccaac 1860

tcacttcctc tgcactctgt gaagagcatc aagtcagact tcattgacaa ggctgaggaa 1920

tccacccaat ctaaagagat aagtcttcct gaagtctctc tattaaaaat tttaaagtta 1980

aacaagcctg aatggccttt tgtggttctg gggacattgg cttctgttct aaatggaact 2040

gttcatccag tattttccat catctttgca aaaattataa ccatgtttgg aaataatgat 2100

aaaaccacat taaagcatga tgcagaaatt tattccatga tattcgtcat tttgggtgtt 2160

atttgctttg tcagttattt catgcaggga ttattttacg gcagagcagg ggaaatttta 2220

acgatgagat taagacactt ggccttcaaa gccatgttat atcaggatat tgcctggttt 2280

gatgaaaagg aaaacagcac aggaggcttg acaacaatat tagccataga tatagcacaa 2340

attcaaggag caacaggttc caggattggc gtcttaacac aaaatgcaac taacatggga 2400

ctttcagtta tcatttcctt tatatatgga tgggagatga cattcctgat tctgagtatt 2460

gctccagtac ttgccgtgac aggaatgatt gaaaccgcag caatgactgg atttgccaac 2520

aaagataagc aagaacttaa gcatgctgga aagatagcaa ctgaagcttt ggagaatata 2580

cgtactatag tgtcattaac aagggaaaaa gccttcgagc aaatgtatga agagatgctt 2640

cagactcaac acagaaatac ctcgaagaaa gcacagatta ttggaagctg ttatgcattc 2700

agccatgcct ttatatattt tgcctatgca gcagggtttc gatttggagc ctatttaatt 2760

caagctggac gaatgacccc agagggcatg ttcatagttt ttactgcaat tgcatatgga 2820

gctatggcca tcggaaaaac gctcgttttg gctcctgaat attccaaagc caaatcgggg 2880

gctgcgcatc tgtttgcctt gttggaaaag aaaccaaata tagacagccg cagtcaagaa 2940

gggaaaaagc cagacacatg tgaagggaat ttagagtttc gagaagtctc tttcttctat 3000

ccatgtcgcc cagatgtttt catcctccgt ggcttatccc tcagtattga gcgaggaaag 3060

acagtagcat ttgtggggag cagcggctgt gggaaaagca cttctgttca acttctgcag 3120

agactttatg accccgtgca aggacaagtg ctgtttgatg gtgtggatgc aaaagaattg 3180

aatgtacagt ggctccgttc ccaaatagca atcgttcctc aagagcctgt gctcttcaac 3240

tgcagcattg ctgagaacat cgcctatggt gacaacagcc gtgtggtgcc attagatgag 3300

atcaaagaag ccgcaaatgc agcaaatatc cattctttta ttgaaggtct ccctgagaaa 3360

tacaacacac aagttggact gaaaggagca cagctttctg gcggccagaa acaaagacta 3420

gctattgcaa gggctcttct ccaaaaaccc aaaattttat tgttggatga ggccacttca 3480

gccctcgata atgacagtga gaaggtggtt cagcatgccc ttgataaagc caggacggga 3540

aggacatgcc tagtggtcac tcacaggctc tctgcaattc agaacgcaga tttgatagtg 3600

gttctgcaca atggaaagat aaaggaacaa ggaactcatc aagagctcct gagaaatcga 3660

gacatatatt ttaagttagt gaatgcacag tcagtgcagt ga 3702

<210> 14

<211> 3621

<212> DNA

<213> Homo sapiens

<400> 14

ttccgctttg ctgatggact ggacatcaca ctcatgatcc tgggtatact ggcatcactg 60

gtcaatggag cctgccttcc tttaatgcca ctggttttag gagaaatgag tgataacctt 120

attagtggat gtctagtcca aactaacaca tactctttct tcaggttgac cctgtattat 180

gttggaatag gtgttgctgc cttgattttt ggttacatac agatttcctt gtggattata 240

actgcagcac gacagaccaa gaggattcga aaacagtttt ttcattcagt tttggcacag 300

gacatcggct ggtttgatag ctgtgacatc ggtgaactta acactcgcat gacagacatt 360

gacaaaatca gtgatggtat tggagataag attgctctgt tgtttcaaaa catgtctact 420

ttttcgattg gcctggcagt tggtttggtg aagggctgga aactcaccct agtgactcta 480

tccacgtctc ctcttataat ggcttcagcg gcagcatgtt ctaggatggt catctcattg 540

accagtaagg aattaagtgc ctattccaaa gctggggctg tggcagaaga agtcttgtca 600

tcaatccgaa cagtcatagc ctttagggcc caggagaaag aacttcaaag gtatacacag 660

aatctcaaag atgcaaagga ttttggcata aaaaggacta tagcttcaaa agtgtctctt 720

ggtgctgtgt acttctttat gaatggaacc tatggacttg ctttttggta tggaacctcc 780

ttgattctta atggagaacc tggatatacc atcgggactg ttcttgctgt tttctttagt 840

gtaatccata gcagttattg cattggagca gcagtccctc actttgaaac cttcgcaata 900

gcccgaggag ctgcctttca tattttccag gttattgata agaaacccag tatagataac 960

ttttccacag ctggatataa acctgaatcc atagaaggaa ctgtggaatt taaaaatgtt 1020

tctttcaatt atccatcaag accatctatc aagattctga aaggtctgaa tctcagaatt 1080

aagtctggag agacagtcgc cttggtcggt ctcaatggca gtgggaagag tacggtagtc 1140

cagcttctgc agaggttata tgatccggat gatggcttta tcatggtgga tgagaatgac 1200

atcagagctt taaatgtgcg gcattatcga gaccatattg gagtggttag tcaagagcct 1260

gttttgttcg ggaccaccat cagtaacaat atcaagtatg gacgagatga tgtgactgat 1320

gaagagatgg agagagcagc aagggaagca aatgcgtatg attttatcat ggagtttcct 1380

aataaattta atacattggt aggggaaaaa ggagctcaaa tgagtggagg gcagaaacag 1440

aggatcgcaa ttgctcgtgc cttagttcga aaccccaaga ttctgatttt agatgaggct 1500

acgtctgccc tggattcaga aagcaagtca gctgttcaag ctgcactgga gaaggcgagc 1560

aaaggtcgga ctacaatcgt ggtagcacac cgactttcta ctattcgaag tgcagatttg 1620
attgtgaccc taaaggatgg aatgctggcg gagaaaggag cacatgctga actaatggca 1680
aaacgaggtc tatattattc acttgtgatg tcacaggata ttaaaaaagc tgatgaacag 1740
atggagtcaa tgacatattc tactgaaaga aagaccaact cacttcctct gcactctgtg 1800
aagagcatca agtcagactt cattgacaag gctgaggaat ccacccaatc taaagagata 1860
agtcttcctg aagtctctct attaaaaatt ttaaagttaa acaagcctga atggcctttt 1920
gtggttctgg ggacattggc ttctgttcta aatggaactg ttcatccagt attttccatc 1980
atctttgcaa aaattataac catgtttgga aataatgata aaaccacatt aaagcatgat 2040
gcagaaattt attccatgat attcgtcatt ttgggtgtta tttgctttgt cagttatttc 2100
atgcagggat tattttacgg cagagcaggg gaaattttaa cgatgagatt aagacacttg 2160
gccttcaaag ccatgttata tcaggatatt gcctggtttg atgaaaagga aaacagcaca 2220
ggaggcttga caacaatatt agccatagat atagcacaaa ttcaaggagc aacaggttcc 2280
aggattggcg tcttaacaca aaatgcaact aacatgggac tttcagttat catttccttt 2340
atatatggat gggagatgac attcctgatt ctgagtattg ctccagtact tgccgtgaca 2400
ggaatgattg aaaccgcagc aatgactgga tttgccaaca aagataagca agaacttaag 2460
catgctggaa agatagcaac tgaagctttg gagaatatac gtactatagt gtcattaaca 2520
agggaaaaag ccttcgagca aatgtatgaa gagatgcttc agactcaaca cagaaatacc 2580
tcgaagaaag cacagattat tggaagctgt tatgcattca gccatgcctt tatatatttt 2640
gcctatgcag cagggtttcg atttggagcc tatttaattc aagctggacg aatgacccca 2700
gagggcatgt tcatagtttt tactgcaatt gcatatggag ctatggccat cggaaaaacg 2760
ctcgttttgg ctcctgaata ttccaaagcc aaatcggggg ctgcgcatct gtttgccttg 2820
ttggaaaaga aaccaaatat agacagccgc agtcaagaag ggaaaaagcc agacacatgt 2880
gaagggaatt tagagtttcg agaagtctct ttcttctatc catgtcgccc agatgttttc 2940
atcctccgtg gcttatccct cagtattgag cgaggaaaga cagtagcatt tgtggggagc 3000
agcggctgtg ggaaaagcac ttctgttcaa cttctgcaga gactttatga ccccgtgcaa 3060
ggacaagtgc tgtttgatgg tgtggatgca aaagaattga atgtacagtg gctccgttcc 3120
caaatagcaa tcgttcctca agagcctgtg ctcttcaact gcagcattgc tgagaacatc 3180
gcctatggtg acaacagccg tgtggtgcca ttagatgaga tcaaagaagc cgcaaatgca 3240
gcaaatatcc attcttttat tgaaggtctc cctgagaaat acaacacaca agttggactg 3300
aaaggagcac agctttctgg cggccagaaa caaagactag ctattgcaag ggctcttctc 3360
caaaaaccca aaattttatt gttggatgag gccacttcag ccctcgataa tgacagtgag 3420

aaggtggttc agcatgccct tgataaagcc aggacgggaa ggacatgcct agtggtcact 3480

cacaggctct ctgcaattca gaacgcagat ttgatagtgg ttctgcacaa tggaaagata 3540

aaggaacaag gaactcatca agagctcctg agaaatcgag acatatattt taagttagtg 3600

aatgcacagt cagtgcagtg a 3621

<210> 15

<211> 2021

<212> DNA

<213> Homo sapiens

<220>

<221> Note

<222> (723)..(723)

<223> n at position 723 represents any nucleotide (A, T, C or G)

<400> 15

ttccgctttg ctgatggact ggacatcaca ctcatgatcc tgggtatact ggcatcactg 60

gtcaatggag cctgccttcc tttaatgcca ctggttttag gagaaatgag tgataacctt 120

attagtggat gtctagtcca aactaacaca tactctttct tcaggttgac cctgtattat 180

gttggaatag gtgttgctgc cttgattttt ggttacatac agatttcctt gtggattata 240

actgcagcac gacagaccaa gaggattcga aaacagtttt ttcattcagt tttggcacag 300

gacatcggct ggtttgatag ctgtgacatc ggtgaactta acactcgcat gacagacatt 360

gacaaaatca gtgatggtat tggagataag attgctctgt tgtttcaaaa catgtctact 420

ttttcgattg gcctggcagt tggtttggtg aagggctgga aactcaccct agtgactcta 480

tccacgtctc ctcttataat ggcttcagcg gcagcatgtt ctaggatggt catctcattg 540

accagtaagg aattaagtgc ctattccaaa gctggggctg tggcagaaga agtcttgtca 600

tcaatccgaa cagtcatagc ctttagggcc caggagaaag aacttcaaag gtctttcctt 660

ttaaatataa caagatatgc ttggttttat tttccccagt ggctactaag ttgtgttctg 720

ttntttgtaa ggtatacaca gaatctcaaa gatgcaaagg attttggcat aaaaaggact 780

atagcttcaa aagtgtctct tggtgctgtg tacttcttta tgaatggaac ctatggactt 840

gctttttggt atggaacctc cttgattctt aatggagaac ctggatatac catcgggact 900

gttcttgctg ttttctttag tgtaatccat agcagttatt gcattggagc agcagtccct 960

cactttgaaa ccttcgcaat agcccgagga gctgcctttc atattttcca ggttattgat 1020

aagaaaccca gtatagataa cttttccaca gctggatata aacctgaatc catagaagga 1080

actgtggaat ttaaaaatgt ttctttcaat tatccatcaa gaccatctat caagattctg 1140

aaaggtctga atctcagaat taagtctgga gagacagtcg ccttggtcgg tctcaatggc 1200

agtgggaaga gtacggtagt ccagcttctg cagaggttat atgatccgga tgatggcttt 1260

atcatggtgg atgagaatga catcagagct ttaaatgtgc ggcattatcg agaccatatt 1320

ggagtggtta gtcaagagcc tgttttgttc gggaccacca tcagtaacaa tatcaagtat 1380

ggacgagatg atgtgactga tgaagagatg gagagagcag caagggaagc aaatgcgtat 1440

gattttatca tggagtttcc taataaattt aatacattgg taggggaaaa aggagctcaa 1500

atgagtggag ggcagaaaca gaggatcgca attgctcgtg ccttagttcg aaaccccaag 1560

attctgattt tagatgaggc tacgtctgcc ctggattcag aaagcaagtc agctgttcaa 1620

gctgcactgg agaaggatac ccccaggtat tcattttgac ctaatttcac ctcaagtgga 1680

gaatcgctga ccttgaacca gcgcccttcg acagctctgg cccctcaaac ctcaccctga 1740

cctcctgctg cctatgagct actgcacata cctcaaggcc atatgcagtt gtggccctgc 1800

accaaattac actgaatcta ggaggggagt tggcagtggc ggtatgaaaa accattgaac 1860

agttttctcg atggcctgac tcccttataa accagagcct tcagacccct tacaaggctt 1920

aatggcacat tttactttgc atttgcttgg aagtgagtta agcgtttttt tttctctaag 1980

aaaatcgcag gcttcttttt ttaaaatgct gactttatgg a 2021

<210> 16

<211> 1940

<212> DNA

<213> Homo sapiens

<400> 16

ttccgctttg ctgatggact ggacatcaca ctcatgatcc tgggtatact ggcatcactg 60

gtcaatggag cctgccttcc tttaatgcca ctggttttag gagaaatgag tgataacctt 120

attagtggat gtctagtcca aactaacaca tactctttct tcaggttgac cctgtattat 180

gttggaatag gtgttgctgc cttgattttt ggttacatac agatttcctt gtggattata 240

actgcagcac gacagaccaa gaggattcga aaacagtttt ttcattcagt tttggcacag 300

gacatcggct ggtttgatag ctgtgacatc ggtgaactta acactcgcat gacagacatt 360

gacaaaatca gtgatggtat tggagataag attgctctgt tgtttcaaaa catgtctact 420

ttttcgattg gcctggcagt tggtttggtg aagggctgga aactcaccct agtgactcta 480

tccacgtctc ctcttataat ggcttcagcg gcagcatgtt ctaggatggt catctcattg 540

accagtaagg aattaagtgc ctattccaaa gctggggctg tggcagaaga agtcttgtca 600

tcaatccgaa cagtcatagc ctttagggcc caggagaaag aacttcaaag gtatacacag 660

aatctcaaag atgcaaagga ttttggcata aaaaggacta tagcttcaaa agtgtctctt 720

ggtgctgtgt acttctttat gaatggaacc tatggacttg ctttttggta tggaacctcc 780

ttgattctta atggagaacc tggatatacc atcgggactg ttcttgctgt tttctttagt 840

gtaatccata gcagttattg cattggagca gcagtccctc actttgaaac cttcgcaata 900

gcccgaggag ctgcctttca tattttccag gttattgata agaaacccag tatagataac 960

ttttccacag ctggatataa acctgaatcc atagaaggaa ctgtggaatt taaaaatgtt 1020

tctttcaatt atccatcaag accatctatc aagattctga aaggtctgaa tctcagaatt 1080

aagtctggag agacagtcgc cttggtcggt ctcaatggca gtgggaagag tacggtagtc 1140

cagcttctgc agaggttata tgatccggat gatggcttta tcatggtgga tgagaatgac 1200

atcagagctt taaatgtgcg gcattatcga gaccatattg gagtggttag tcaagagcct 1260

gttttgttcg ggaccaccat cagtaacaat atcaagtatg gacgagatga tgtgactgat 1320

gaagagatgg agagagcagc aagggaagca aatgcgtatg attttatcat ggagtttcct 1380

aataaattta atacattggt aggggaaaaa ggagctcaaa tgagtggagg gcagaaacag 1440

aggatcgcaa ttgctcgtgc cttagttcga aaccccaaga ttctgatttt agatgaggct 1500

acgtctgccc tggattcaga aagcaagtca gctgttcaag ctgcactgga gaaggatacc 1560

cccaggtatt cattttgacc taatttcacc tcaagtggag aatcgctgac cttgaaccag 1620

cgcccttcga cagctctggc ccctcaaacc tcaccctgac ctcctgctgc ctatgagcta 1680

ctgcacatac ctcaaggcca tatgcagttg tggccctgca ccaaattaca ctgaatctag 1740

gaggggagtt ggcagtggcg gtatgaaaaa ccattgaaca gttttctcga tggcctgact 1800

cccttataaa ccagagcctt cagacccctt acaaggctta atggcacatt ttactttgca 1860

tttgcttgga agtgagttaa gcgttttttt ttctctaaga aaatcgcagg cttcttttt 1919

taaaatgctg actttatgga 1940

<210> 17

<211> 15

<212> PRT

<213> Homo sapiens

<400> 17

Leu Ser Gly Gly Gln Lys Gln Arg Ile Ala Ile Ala Arg Ala Leu
1 5 10 15

<210> 18

<211> 15

<212> PRT

<213> synthetic peptide

<400> 18

```
Cys Gly Thr Ser Leu Ile Leu Asn Gly Glu Pro Gly Tyr Thr Ile
1               5                   10                  15
```

<210> 19

<211> 17

<212> PRT

<213> synthetic peptide

<400> 19

```
Arg Phe Gly Ala Tyr Leu Ile Gln Ala Gly Arg Met Thr Pro Glu Gly
1               5                   10                  15

Cys
```